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ENVIRONMENT
& HEALTH

Rebuttal Report of

Jonathan C. Johnson, PhD

7/21/2025

Regarding:

WEST VIRGINIA RIVERS
COALITION, INC.,
Plaintiff,
v.
THE CHEMOURS COMPANY FC, LLC,

Civil Action No. 2:24-cv-00701

Jonathan C. Johnson, PhD
Senior Manager, Site Solutions
101 Carnegie Center, Suite 200
Princeton, New Jersey 08540

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Contents

1. Introduction

I have been retained by external counsel to Chemours to provide expert opinions regarding PFAS fate and transport from the Chemours Washington Works Facility to the groundwater wells operated by Little Hocking Water Association (LHWA) in the matter of *West Virginia Rivers Coalition, Inc. and The Little Hocking Water Association, Inc. v. Chemours* (No 2:24-cv00701). I have been retained to respond to reports authored by Plaintiff LHWA's expert, Dr. Franklin W. Schwartz. In this report I summarize analysis and research I have performed and opinions offered in rebuttal to LHWA's expert regarding the transport of PFAS from the Chemours facility to the LHWA production wells.

These rebuttal opinions are offered in concert with my opinions in my expert report dated July 14, 2025. Each of these rebuttal opinions either responds to a specific claim offered by Dr. Schwartz and either discusses where Dr. Schwartz's approach which is internally inconsistent or discusses where Dr. Schwartz's opinion is inconsistent with the information in the materials available.

I note at the outset that Dr. Schwartz has not performed any affirmative calculations or analysis in his expert report regarding his primary claim that PFAS at LHWA wells is primarily sourced from the Ohio River. Data are available for the Ohio River concentrations, the overlying and surrounding soils concentrations, and concentrations at surrounding wells not connected to the river. Yet, Dr. Schwartz does not attempt to substantiate his claims. As shown in my affirmative report and in these rebuttal comments, the available data and the available analysis strongly indicate that 1) the soils concentrations are high enough to create the concentrations in the wellfield, 2) the river concentrations due to effluent are too low to create measurable concentrations in the LHWA wellfield and 3) there is a

large spatial separation between the Washington Works effluent and the capture zone of the LHWA wellfield in the Ohio River.

Section 2 of this report summarizes my qualifications. Section 3 describes the basis for each of my opinions. Section 4 lists the materials relied upon in this report.

This report was prepared based on information available to me at the time of writing; I reserve the right to amend or supplement this report if additional information becomes available.

2. Summary of Qualifications

My name is Jonathan Johnson, I was granted a PhD in 1998 from Princeton University in the Department of Civil Engineering, I have worked on flow and transport problems for 30 years including modeling, field investigations, and laboratory investigations. I have written and used unsaturated zone infiltration models, and groundwater flow and contaminant transport codes for many classes of contaminants. I have worked extensively on quantifying and modeling surface-water groundwater interactions starting in 1997 while employed with the USGS. I have experience and education regarding evaluation of data and simulations of surface water flow, groundwater flow and contaminant transport.

Recent matters that I am or have been engaged in including providing expert testimony follow:

- Currently engaged as testifying expert for the defendant in State of Vermont Superior Court. State of Vermont v. 3M Company 547-6-19.
- Currently engaged as testifying expert for the defendant in United States District Court District of New Jersey. New Jersey Department of Environmental Protection v. EI du Pont de Nemours and Company 1:19-cv-11766-RMB-JBC.
- Currently engaged by the Arizona State Attorney General regarding State of Arizona v. Fondomonte Arizona LLC No. CV2024-035721.
- Testified as expert for groundwater hydrology issues including groundwater/surface water interactions, groundwater models, and allocation of costs on behalf of DTE Gas Company for Ford Motor Company and AK Steel Corporation v. DTE Gas Company Civil Case No. 2:08-CV-13503. Provided written expert report and testimony in deposition. Provided testimony in trial with three Judge panel.

3. Rebuttal to Dr. Schwartz Opinions

Rebuttal to Opinion 1:

Even when Dr. Schwartz concern regarding the dissimilar 20 cells is addressed, there is little if any discernable impact on the amount of distance that the LHWA wells extend their capture beneath the river. The change is small and the capture area remains far from the >1000 dilution zone from the Chemours Outfalls.

In Dr. Shwartz's 2014 Supplemental Expert Report and in Dr. Shwartz's 2025 report, a major point of discussion is about a set of riverbed permeability values used in the 2003 DuPont groundwater model. Dr. Schwartz's 2025 technical claim:

"As explained in my 2014 expert report, these strategic additions of elevated leakage values for 20 river-bed nodes in the model adjacent to the Little Hocking wellfield, were obviously designed to limit the extent of the capture zone of wells at Little Hocking beneath the Ohio River." (Schwartz 2025, pp2-3).

The specific issue was with the properties of a set of model grid cells known as the 20 cells[1]. Dr. Schwartz' in his 2014 expert report appeared to have sufficient basis to question the impact of the properties of the riverbed. However, subsequent work by Bair (2014) tested Dr. Schwartz hypothesis and ultimately showed that the results of the model (with respect to the extent of capture of LHWA wells out into the river) are neither materially impacted by changing those 20 cells, nor are they materially impacted by drastically reducing pumping from the West Virginia side of the river at the Washington Works extraction system. The Bair 2014 model runs were more general in scope, but for the purposes of this matter, in 2025, they definitively show that the extent of the reach of the LHWA capture below the Ohio River does not even come close to reaching the >1000 dilution line from any of the Washington Works Outfalls described in my Expert Report (Johnson 2025) even with favorable pumping and riverbed properties. The simulation objectives and results are explained in more detail below.

In the expert report of Dr. Bair, three hypothetical modeling simulations were performed to explore Dr. Schwartz's claim about the significance of the vertical permeability in these cells.

"Three simulations, each with different pumping rates assigned to the DuPont wellfields and to the LHWA wellfield, were run using this configuration of riverbed permeabilities. The pumping rates assigned to the DuPont wellfields were based on the specified minimum operating rate, which is 65 percent of the rates used in the calibrated Model (DuPont, 2003). The three pumping rates assigned in the riverbed permeability simulations to the DuPont wellfields were 100 percent of the operating minimum, 75 percent of the operating minimum, and 50 percent of the operating minimum. The pumping rate assigned to the LHWA wellfield was held constant at the historical annual maximum monthly rate for each well. [...] ***Thus, the testing of Schwartz' hypothesis focused on setting the riverbed permeability of the "pink cells" to a lower value and observing the changes that value creates in the capture zones of the LHWA wells under three different sets of pumping rates."*** (Bair 2014 Page 5-3, **emphasis mine**).

Dr. Bair's report presents the capture zones of LHWA wells under four different scenarios. In the first scenario, all four LHWA wells are pumping with the original permeability of the 20 cells as used in the 2003 model. That is the first scenario represents essentially[2] the same pumping conditions and riverbed conditions as used in the 2003 model. This scenario represents the conditions with the 20 cells that are objected to by Dr. Schwartz. These capture zones are presented in **Figure 1** (from Bair 2014 Figure 4-7).

[1] In Schwartz 2025 Opinion 1 he alternately refers to this issue as "22 river cells" or "20 river bed nodes" or the "20 cells", in prior reports these were referred to as the "pink cells" Schwartz 2013.

[2] LHWA extraction rates in the 2003 model were 861 gallons per minute (gpm), this was updated to 884 gpm in the simulations described in Section 5 of the Bair 2014 report which are referenced in this opinion .

However, in the remaining simulations, which are hypothetical conditions, we find that adjusting those 20 cells or drastically changing pumping at Washington Works makes no difference regarding the ability of the LHWA wells to capture river water with effluent in it. In all simulated cases, the LHWA well capture from the river is far from the >1000 dilution line. In the three further scenarios, Dr. Bair explores two effects which both would serve to increase the potential distance of the LHWA capture zones beneath the river: reducing the permeability of the 20 cells to match the other riverbed permeability values in the river, and reducing the pumping rate of the DuPont wells. **Table 1** shows these pumping and permeability scenarios. I have presented these four capture zones on figures which also show the modeled area of influence of concentration from the outfalls in **Figure 1 through Figure 4**. The LHWA capture zones in these figures are taken from Bair 2014 (Figures 4-7, and 5-3 through 5-5).

Figure Number in this report	Bair Figure Number	LHWA Pumping Scenario	DuPont Pumping Scenario	Riverbed permeability in 20 cells
Figure 1	4-6	Wells 1-5; 861 gpm	2003 DuPont Model Rates	30 ft/day
Figure 2	5-3	Wells 1-5; 884 gpm	100% of operating minimum	0.3 ft/day
Figure 3	5-4	Wells 1-5; 884 gpm	75% of operating minimum	0.3 ft/day
Figure 4	5-5	Wells 1-5; 884 gpm	50% of operating minimum	0.3 ft/day

Table 1 Description of the Bair (2014) Baseline Pumping Simulation and the Three Hypothetical Simulations

Even in the hypothetical scenario representing an extreme case, which would provide the LHWA the largest distance of capture into the Ohio River (**Figure 3)**, the capture zone of the LHWA wellfield remains far from the modeled dilution zone impacted by the outfalls. In addition, at its closest point of intersection: 1) the effluent is already diluted by greater than 1000, 2) any river water captured in the LHWA system from that area is then diluted with all of the rest of the water captured by the LHWA system, and 3) the water in the LHWA system coming from western edge of their capture zone is along one of the longest groundwater pathways leading to their extraction system, with that pathway representing water that take more than a decade to move from the river water infiltration to the LHWA extraction wells (Burgess and Niple 1996).

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Rebuttal to Opinion 2:

Along with the results of the groundwater model, data and analysis to address the distribution of PFAS in the Ohio River exist, and together these clearly demonstrate that the river pathway hypothesis can be rejected.

The existence of the river pathway is predicated on three values. First, how far out beneath the river does the capture zone extend; second, does effluent travel in the surface water far enough to coincide with this capture zone area; third, are compelling concentrations expected.

Dr. Schwartz (2025) claims that "The groundwater model by itself provides no information about the existence of the river pathway". That is only partially true, it does not describe the distribution of effluent in the river, but it does compute the extent of the reach of the LHWA capture zone. Dr. Schwartz defines the river pathway on page 2:

"My analyses, as set forth in these reports, demonstrate that PFAS present in water released from both point and non-point sources at the Washington Works site are transported in the Ohio River ***to areas coinciding with the capture zone of the Little Hocking wellfield****. Induced infiltration of river water to the groundwater moves PFAS to pumped wells in the Little Hocking wellfield."* Schwartz 2025 (**emphasis added**).

The existence and importance of this Ohio River Sampling data is described in Opinion 4 below.

Rebuttal to Opinion 3:

The reach of the capture zone to one mile downstream from the extraction wells does not result in the LHWA capture coinciding with effluent from Washington works. Further, the extent of the LHWA capture zone to 1-mile down-stream from its extraction wells is not in contention, it is simply a prediction of the LHWA 1996 and DuPont 2003 models and is an obvious consequence of the hydrogeologic conditions of the wellfield and the rate of pumping.

Dr. Schwartz reiterates in his 2025 report that:
"The new information provided by Chemours does not change my scientific opinion that the Little Hocking capture zone extends more than a mile downstream from the Little Hocking wellfield"
(Schwartz 2025 p3)

In my review of the opinions and testimony provided in the documents I reviewed, this claim is not contested. The fact that the capture zone extends one mile downstream does not demonstrate existence of the river pathway since this capture zone is not coincident with the area where outfall effluent is located. The zone of the river where PFAS from the outfalls would be expected to mix does not intersect with the area of the capture zone of the LHWA wells. This is described in more detail in my expert report, the figures in that report are reproduced here as **Figures 5 through 7.** These figures show the locations where the outfall concentration is diluted by 1000 times in the river, and the zones where the

LHWA well field captures from below the river, clearly showing significant separation even at the 1-mile down-stream western end of the LHWA wellfield capture.

Rebuttal to Opinion 4:

Surface water data has been gathered on multiple occasions that measured concentrations at or near the Washington Works Outfalls and concentrations measured further from shore. These sampling events include locations that fall between the LHWA well field capture zone and the Washington Works Outfalls. Consistently these Ohio River sampling results show a decrease in concentrations from high values near the Washington Works outfalls on the West Virginia side to non-detect values towards the Ohio side (or when up-river concentrations are found above detection limits, sometimes concentrations decrease to the up-river concentration rather than to non-detect on the Ohio side).

Dr. Schwartz considers the data gathered in the Ohio River to be a "*grab-bag of river sampling [that] has no scientific value to answer the question about whether river discharges from Washington Works eventually end up in the Little Hocking wellfield.*" (Schwartz 2025 p3). Dr. Schwartz avoids discussion of the surface water data that exist. Relevant surface water sampling data does exist and it can be used as a line of evidence to examine whether a river pathway from outfall effluent to LHWA capture zone exists.

Surface water data that lies between the outfalls of the Washington Works facility and the capture zone of the LHWA wellfield beneath the Ohio river have been taken in 6/2002, 10/2011, 9/2016, 8/2017 and 11/2017. (2024 CSM Figure 6-17, FWS-000373, FW-000374, and FWS-000375)

Results from 9/2016 for PFOA, 8/2017 for PFOA, and 11/2017 for PFOA and HFPO-DA are shown in **Figures 8 through 11**. These figures depict concentrations of PFOA and HFPO-DA found in samples taken from the Ohio River during a particular event. Samples are taken at different distances from shore (and sometimes at different depths). The results show that concentrations near the Washington Works outfalls or downriver from the outfalls contain elevated concentrations related to effluent into the river, but that as you cross the river concentrations quickly fall off to non-detect[3].

As described in my Expert report Opinion 3 a surface water model was constructed that was calibrated to the 2017 Surface water data and demonstrates that the effluent would be diluted by over 1000 times near shore on the Ohio side, far from any portion of the LHWA well field capture area. The only outfall where effluent is pushed significantly into the river (Outfall 005) is down river and beyond the furthest extent of the capture zone for the LHWA well field. The remaining outfalls reach their >1000 dilution very near to shore, just as is observed in the data. This is shown in **Figures 5 through 7** and described further in Opinion 5.

[3] Some sampling events show a background concentration that is present up river so the minimum concentration moving away from the outfall is due to upriver (background) concentrations, and unrelated to the Washington Works Ohio River effluent.

Rebuttal to Opinion 5:

The case for the lack of a river pathway is well supported by multiple lines of evidence including observations, Ohio River sampling data, and modeling.

Dr. Schwartz states regarding the air deposition vs river pathway vs sub river pathway that "Chemours based its conclusion solely on its own belief that PFAS was not arriving through the River Pathway or Sub-River groundwater Pathway, so it must be arriving through the air."
On the contrary, the Chemours position is supported by several lines of evidence including in stream concentrations, groundwater modeling, surface water modeling, and concentration data from wells not connected to the river where air deposition is the only possible pathway, below are scientific facts and analysis that demonstrate the River Pathway is not supportable.

1. in stream concentrations decrease to non-detect as you cross the river, with exceptions only occurring when upstream concentrations are providing some background concentrations, in that case the concentrations decrease to the background concentration (**Figures 8 through 10).**
2. Surface water modeling analysis as described in my Expert Report (Johnson 2025) Chemours conducted surface water modeling as part of their NPDES discharge permit. This modeling is well calibrated. It both fits the data and predicts the distribution of PFAS under other flow conditions. Specifically, for the purposes of this case, it calculates where the dilution is more than 1000 times the original discharge in the river (**Figures 5, 6** and **7).**
3. Visual observation of the outfalls and the Ohio River can provide qualitative evidence as can be seen in the satellite photography in **Figure 11.** This photograph is annotated with the locations of the outfalls and the in-stream features that show the extent of the disturbance of an outfall for the particular day of the image. In the image the disturbance of the sediment in the River can result in a visual tracer for the flow from a particular location or disturbance. In the River the most prominent feature is the disturbance due to Outfall 005. Its shape and extent is similar to the model predictions of solute flow. Similarly, there is some disturbance near the other outfalls along the Washington Works shores, but not much can be seen, as these outfalls are at lower volumes and therefore the effluent stays near the West Virginia shoreline for the entire distance to Outfall 005.

4. LWHA Well 1 is contaminated at a similar concentration to all of the other FWHA wells. FWHA 1 does not draw any of its water from the river but instead from land surface infiltration through areas with soils known to be contaminated with pfas in concentrations that are sufficient by themselves to result in the concentrations seen in the LHWA wells. **Figures 5 through 7** show the footprint that is captured by LHW1 and how it does not include capture from the river and therefore does not have a river pathway. And yet still has high concentrations of PFOA and HFPO-DA. In sampling from March 2025 LHW1 had a PFOA concentration of 4500 ng/L and an HFPO-DA concentration of 230 ng/L. LHW2 has a similar order of magnitude of concentrations: PFOA of 3200 ng/L and HFPO-DA of 200 ng/L and also has a significant portion of the capture zone associated with land surface infiltration. LHW3 is the well which is closest to the Ohio River and its March 2025 concentrations, PFOA of 120 ng/L and HFPO-DA of 19 ng/L respectively, are lower than LHW1 and LHW2 (Chemours 2025c; Table 2; FWS-000897).[4] Dr. Schwartz contends

[4] LHW5 has higher concentrations than these other wells in the March 2025 sampling event. LHW5 is pumping less frequently than the other wells so its true capture zone is more dynamic than the steady state model being presented by Dr. Bair.

that most of the PFAS is from the river pathway. These data indicate that it is not a supportable hypothesis.[5]

5. Wells in the neighboring community that are not connected to the river have concentration of similar magnitude that are solely due to atmospheric deposition on the land surface. In my expert report (Johnson 2025 Figures 3 and 4) dozens of locations can be identified within a few miles of the LHWA wellfield that have no connection to the river and yet have concentrations in groundwater similar to that found in the LHWA wellfield.
6. Measured PFOA in soil data over the LHWA wellfield is sufficient by itself to produce concentrations in groundwater that are similar to what is found in LHWA well water. These calculations were provided in my expert report (Johnson 2025 Expert Report Opinion 2).
7. Groundwater modeling by Burges and Niple (1996) on behalf of LHWA and by DuPont 2003 and by Bair (2014) show that the extent of the capture zone for the LHWA wellfield does not reach beneath the Ohio River very far, and is distant from the effluent extent described in the surface water modeling.

Rebuttal to Opinion 6:

During Mr. Hartten's June 30, 2025 deposition there is no claim of a closed loop maintaining complete capture. In fact, Mr. Hartten had to defend against just such a suggestion made by opposing counsel.

Hartten June 30, 2025 Deposition: Page 118 lines 3-11
Q. Are you claiming that this loop system captures the contamination -- all of the contamination from the west -- from the Washington Works outlets entering the river?
A. No. No, no, no, no, no. So the induced recharge is estimated somewhere between 20 and 30 percent of what that well is receiving. So it's -- it's just a portion.
Q. Okay.

Dr. Schwartz' concept of an all capturing "so called recirculation loop" did not come from Mr. Hartten in his 2025 deposition, and both parties seem to be in agreement that there is recapture of some effluent by the water withdrawals of the Washington Works extraction system, and that some effluent continues down river.

Rebuttal to Opinion 7:

The argument given by Dr. Schwartz regarding the composition and distribution of the sediments at the bottom of the Ohio River would result in increased separation between the groundwater capture zone for LHWA and the effluent >1000 dilution line in the surface water. Which is counter to his hypothesis of a river pathway.

Dr. Schwartz provides an opinion regarding the composition and distribution of the sediments at the bottom of the Ohio River in Opinion 7 of his 2025 report. Implementing his suggested conclusion would

[5] All of the PFOA values seen at LHWW groundwater are entirely consistent with the magnitude of the PFOA measured in overlying soils (as discussed in my 2025 Expert Report.

reduce the extent of the LHWA capture zone below the Ohio River and increase the extent of the Washington Works well field capture zone below the river. This argument is counter to his hypothesis of a river pathway.

"Chemours testified that the Holocene Clay/Silt layer, which is poorly permeable and retards infiltration from the River, extends on the Eastern part of Washington Works to a point that aligns with about the midpoint of Blennerhassett Island and extends well past the Western wellfield, about 3 miles down-river on the Western End of the Site. (Hartten, June 30, 2025, pp. 137-143). The existence of this clay barrier impacts the ability of wells on the Washington Works side to capture groundwater from the Ohio River. ***Little Hocking's interface with the river, in contrast, is sandy allowing for more readily induced infiltration into the Little Hocking wellfield."*** (Schwartz 2025 page 5, **emphasis** mine).

Increasing the riverbed to be sandy on the Little Hocking side of the river results in a hydrogeologic condition where it is easier to withdraw water through the riverbed and so the capture zone does not reach out very far beneath the river to obtain the water volume necessary. Applying lower permeability to the Washington Works side of the riverbed results in less efficient capture of water from below the river, so the capture zone must reach out further beneath the river to obtain the required water volume. This would essentially result in an increased separation distance between the groundwater capture zone for LHWA and the effluent >1000 dilution line in the surface water.

4. Materials Relied On

Bair 2014. Expert report of E. Scott Bair PhD regarding The Little Hocking Water Association, Inc. versus DuPont de Nemours and Company. February 15.

Burgess and Niple 1996. Wellhead Protection Plan Determination of Wellhead Protection Areas and Potential Pollution Source Inventory, Little Hocking Water Association inc. November.

Chemours WV0001279 Permit Renewal. February 2023.

Chemours WV0001279 Permit Renewal. December 2024.

Chemours WV DEP Final Permit. Permit Number WV0001279 July 2018.

Chemours 2025a. 2024 Routine Monitoring and Corrective Measures Assessment Report, Chemours Washington Works Plant, Washington, West Virginia. May 30.

Chemours 2025b. Quarterly Progress Report No. 34 – 2009 Consent Order as Amended, Chemours Washington Works. Docket Nos. SDWA-03-2009-1027 & SDWA-05-2009-0001. July 1.

Chemours 2025c. Little Hocking Water Association PFAS Analytical Results – Granular Activated Carbon Treatment System – May 2025 No. 1,2, and 3 Biweekly Sampling Events. June 27.

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DuPont Corporate Remediation Group, 1999. RCRA Facility Investigation Plan: Dupont Washington Works, Washington WV. June.

DuPont Corporate Remediation Group. 2003. Revised Groundwater Flow Model, DuPont Washington Works, Washington, WV. January.

DuPont Corporate Remediation Group. 2004. Revised Sampling Investigation Results, Little Hocking Water Association Well Field. Washington County, Ohio. February.

Schwartz 2013. Expert Report of Franklin W. Schwartz regarding The Little Hocking Water Association, Inc. versus DuPont de Nemours and Company. February 15.

Schwartz 2014. Supplemental Expert Report regarding The Little Hocking Water Association, Inc. versus E.I. DuPont de Nemours and Company. April 24.

Schwartz 2025. Expert Report of Franklin W. Schwartz for Plaintiff-Intervenor the Little Hocking Water Association regarding West Virginia Rivers Coalition versus The Chemours Company. July 4.

LimnoTech 2023. Request for Site Mass Loading Cap and Site-Specific Mixing Zone at the Chemours Washington Works Facility. February 22.

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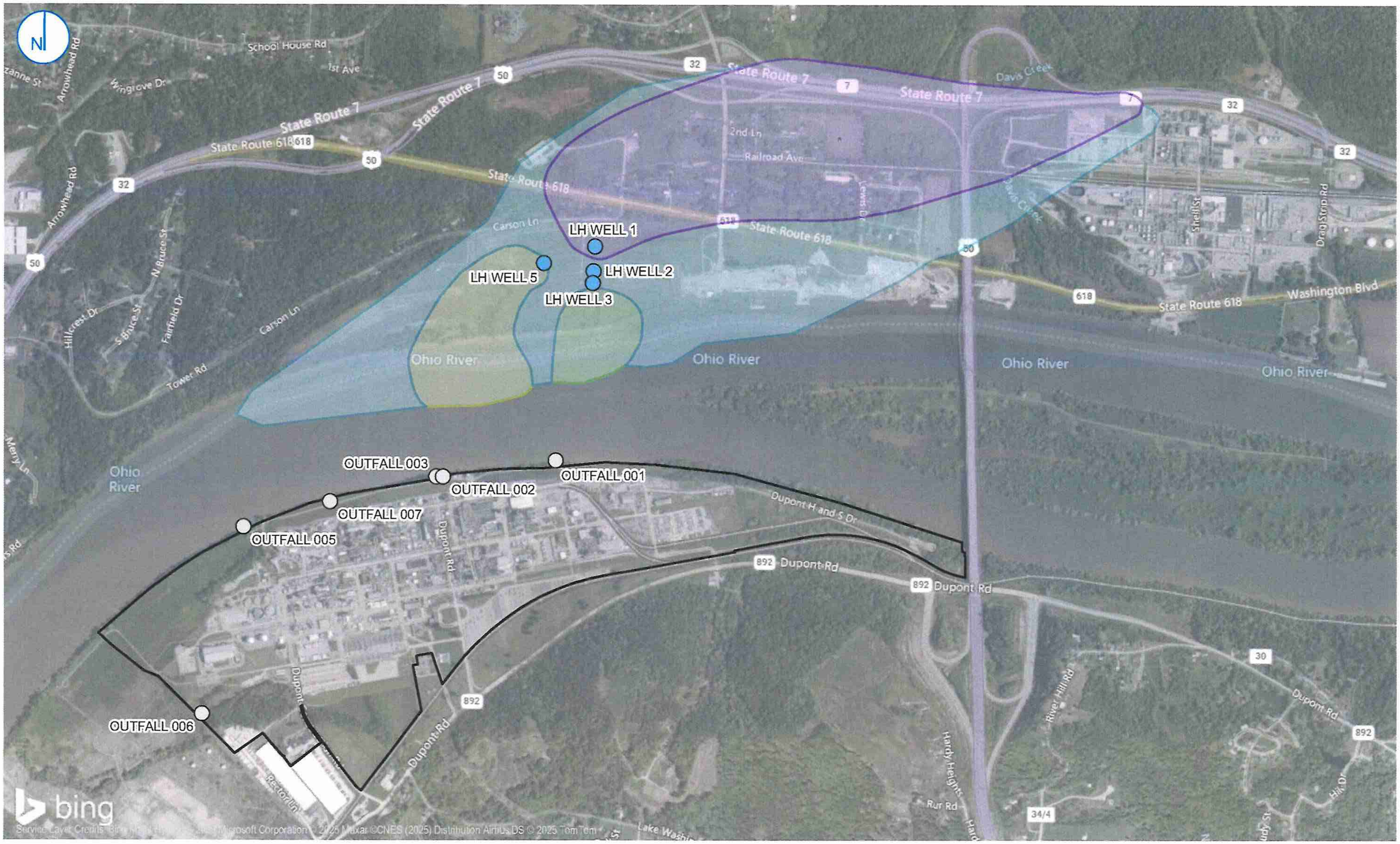

CHEMOURS FACILITY PROCESS OUTFALL

LITTLE HOCKING EXTRACTION WELL

CHEMOURS FACILITY

LHWA CAPTURE ZONES

WELL 1

WELL 2

WELL 3

WELL 5

0 800 1,600 Feet

EXTENT OF THE CAPTURE ZONES OF THE LHWA WELLFIELD ALONG THE OHIO RIVER AND WASHINGTON WORKS OUTFALL DILUTION FACTORS - TYPICAL PUMPING CONDITIONS

NOTE
LHWA CAPTURE ZONES ADAPTED FROM FIGURE 4-7 OF EXPERT REPORT OF SCOTT BAIR, 2014

FIGURE 1

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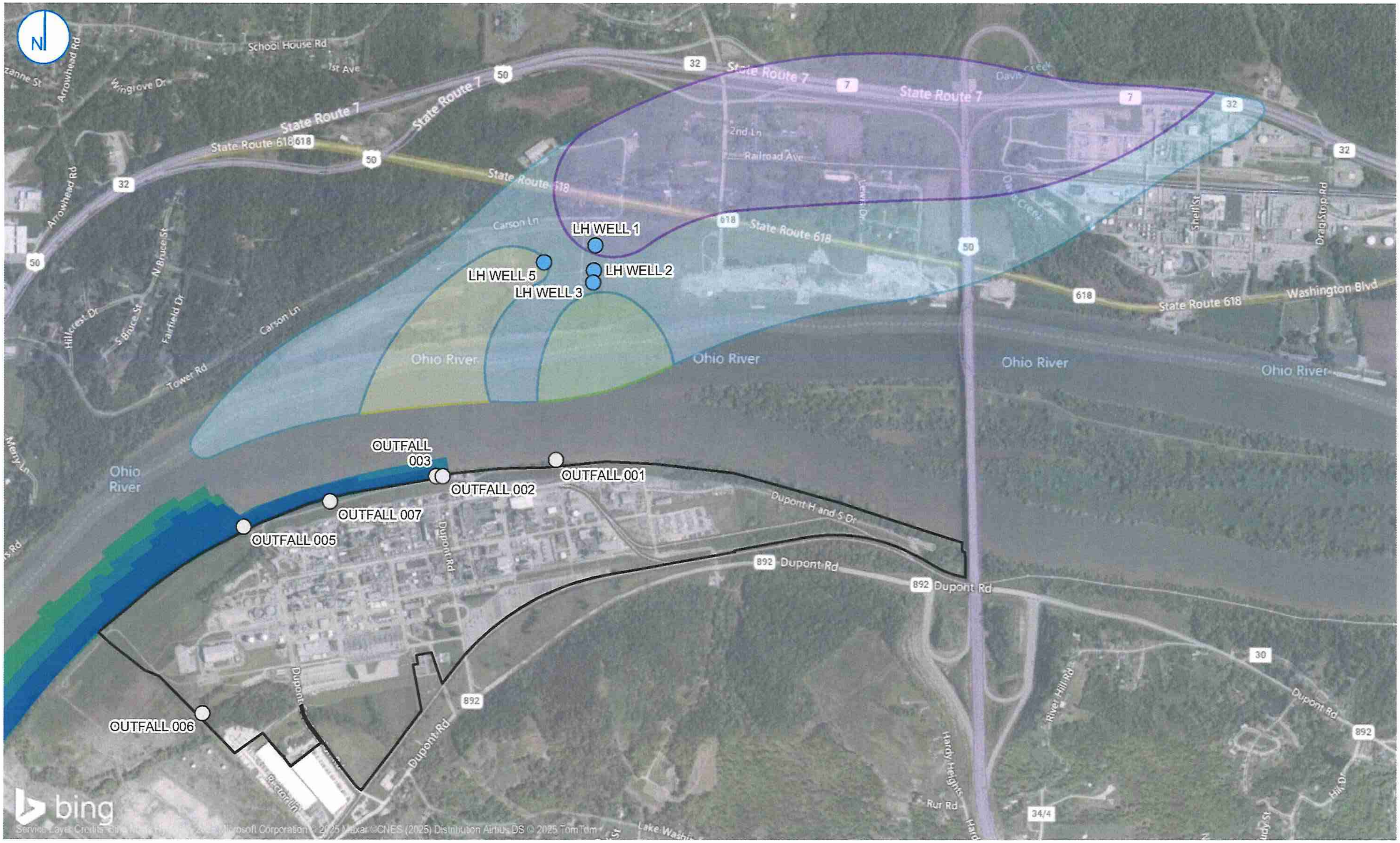

CHEMOURS FACILITY PROCESS OUTFALL

LITTLE HOCKING EXTRACTION WELL

CHEMOURS FACILITY

0 800 1,600 Feet

LHWA CAPTURE ZONES

WELL 1

WELL 2

WELL 3

WELL 5

OUTFALL DILUTION (MAGNITUDE 1,000:1)

OUTFALL 003

OUTFALL 002

OUTFALL 005

EXTENT OF THE CAPTURE ZONES OF THE LHWA WELLFIELD ALONG THE OHIO RIVER AND WASHINGTON WORKS OUTFALL DILUTION FACTORS – HYPOTHETICAL RIVERBED SENSITIVITY CALCULATION 1

NOTES

1. LHWA CAPTURE ZONES ADAPTED FROM FIGURE 5-3 OF EXPERT REPORT OF SCOTT BAIR, 2014
2. MAGNITUDE OF OUTFALL DILUTION ADAPTED FROM FIGURES 15-17, LIMNOTECH, 2023

FIGURE 2

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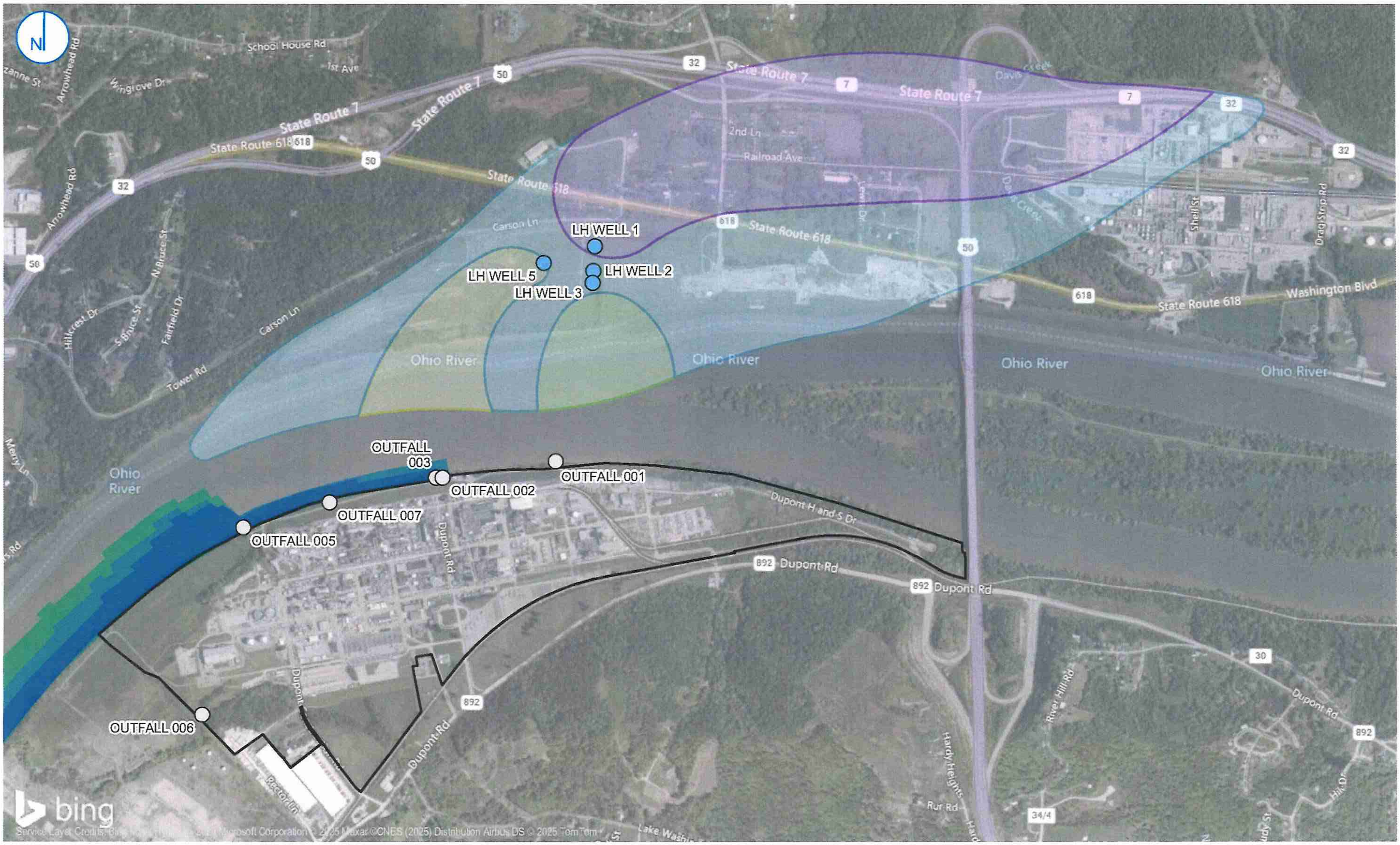

CHEMOURS FACILITY PROCESS OUTFALL

LITTLE HOCKING EXTRACTION WELL

CHEMOURS FACILITY

LHWA CAPTURE ZONES

WELL 1

WELL 2

WELL 3

WELL 5

OUTFALL DILUTION (MAGNITUDE 1,000:1)

OUTFALL 003

OUTFALL 002

OUTFALL 005

0 800 1,600 Feet

EXTENT OF THE CAPTURE ZONES OF THE LHWA WELLFIELD ALONG THE OHIO RIVER AND WASHINGTON WORKS OUTFALL DILUTION FACTORS – HYPOTHETICAL RIVERBED SENSITIVITY CALCULATION 2

NOTES
1. LHWA CAPTURE ZONES ADAPTED FROM FIGURE 5-4 OF EXPERT REPORT OF SCOTT BAIR, 2014
2. MAGNITUDE OF OUTFALL DILUTION ADAPTED FROM FIGURES 15-17, LIMNOTECH, 2023

FIGURE 3

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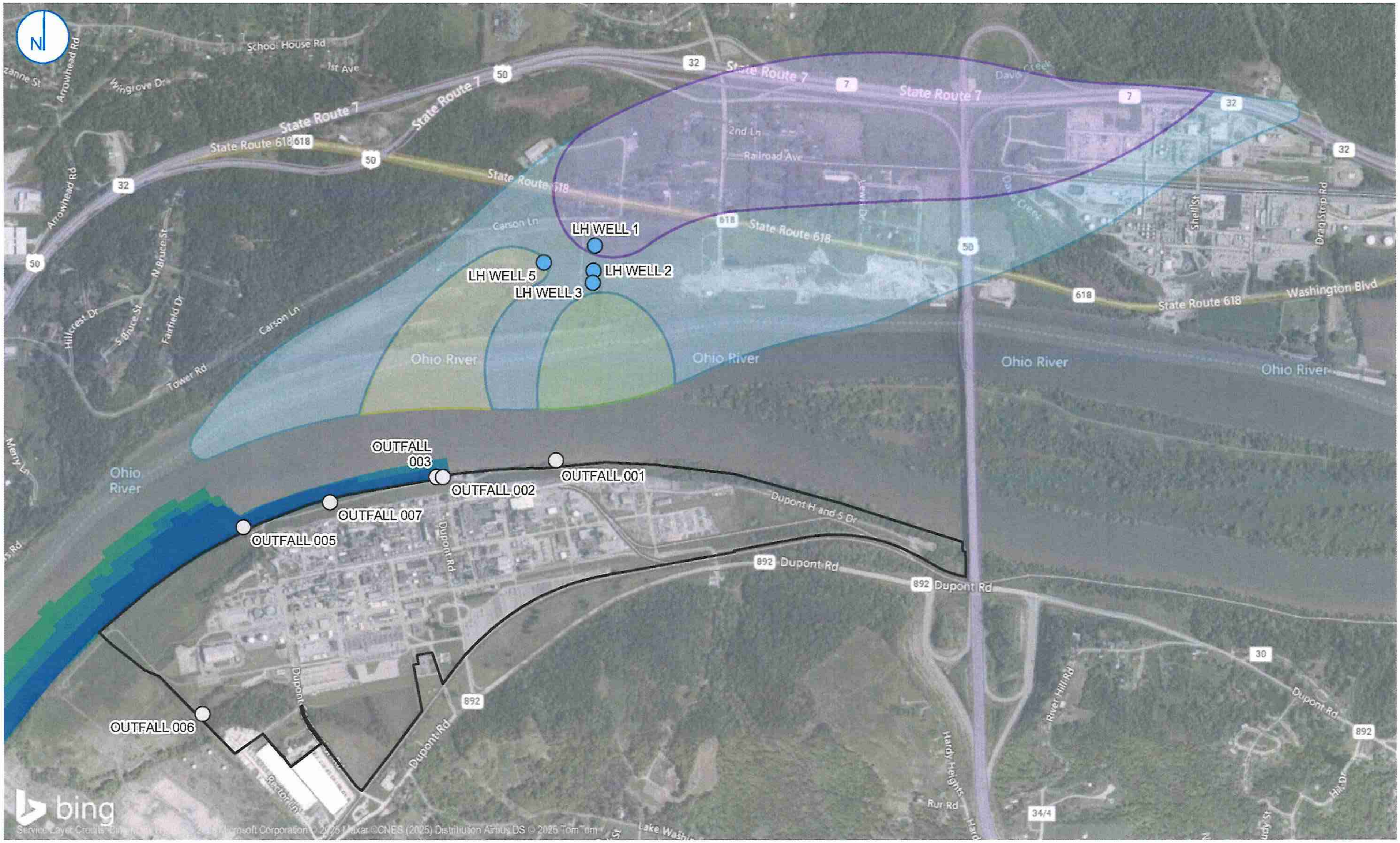

CHEMOURS FACILITY PROCESS OUTFALL

LITTLE HOCKING EXTRACTION WELL

CHEMOURS FACILITY

0 800 1,600 Feet

LHWA CAPTURE ZONES

WELL 1

WELL 2

WELL 3

WELL 5

OUTFALL DILUTION (MAGNITUDE 1,000:1)

OUTFALL 003

OUTFALL 002

OUTFALL 005

EXTENT OF THE CAPTURE ZONES OF THE LHWA WELLFIELD ALONG THE OHIO RIVER AND WASHINGTON WORKS OUTFALL DILUTION FACTORS – HYPOTHETICAL RIVERBED SENSITIVITY CALCULATION 3

NOTES
1. LHWA CAPTURE ZONES ADAPTED FROM FIGURE 5-5 OF EXPERT REPORT OF SCOTT BAIR, 2014
2. MAGNITUDE OF OUTFALL DILUTION ADAPTED FROM FIGURES 15-17, LIMNOTECH, 2023

FIGURE 4

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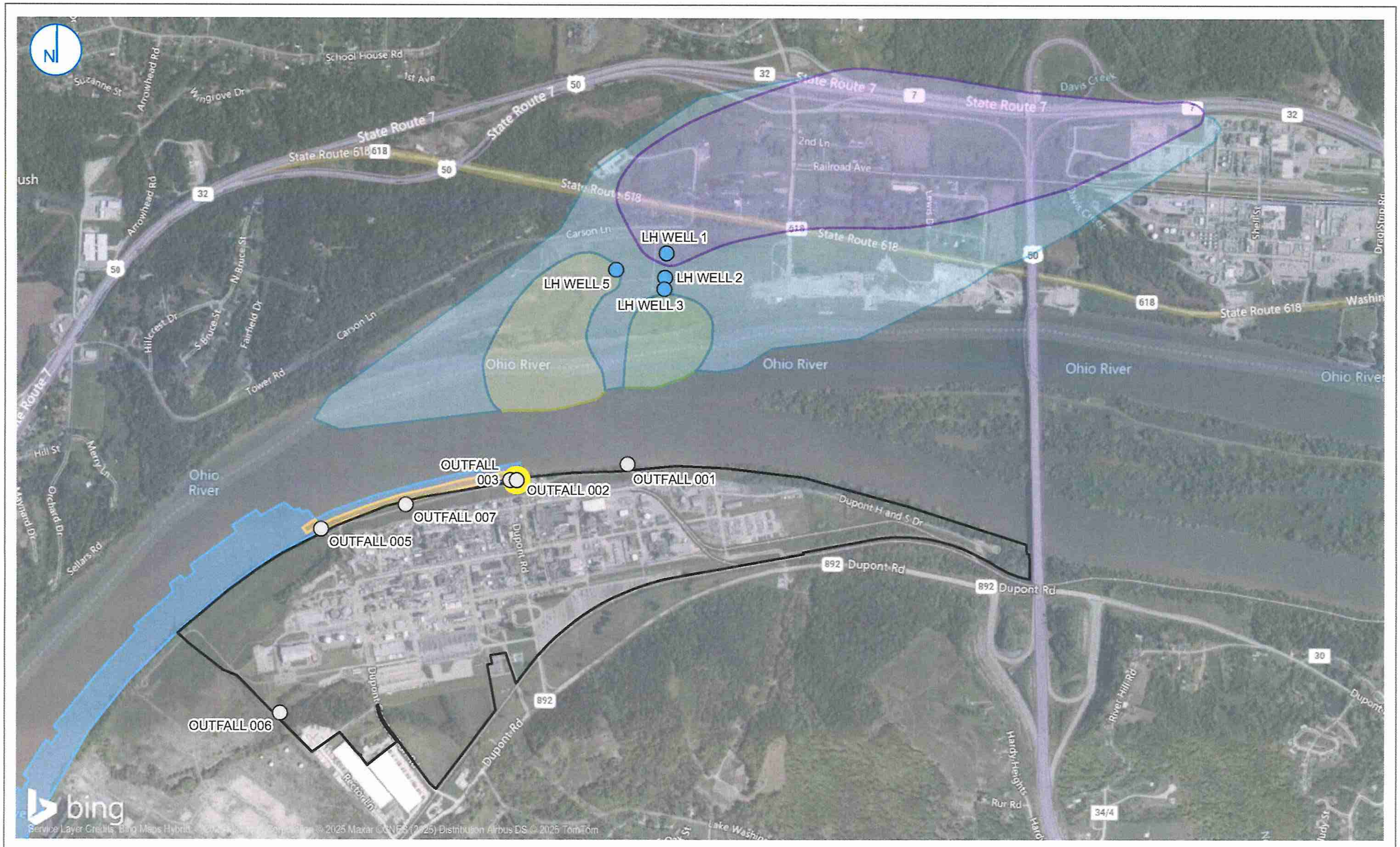

○ CHEMOURS FACILITY PROCESS OUTFALL
● LITTLE HOCKING EXTRACTION WELL
▭ CHEMOURS FACILITY

LHWA CAPTURE ZONES
- WELL 1
- WELL 2
- WELL 3
- WELL 5

MAGNITUDE OF OUTFALL DILUTION
- 100:1
- 1,000:1

0 800 1,600 Feet

OUTFALL 002 DILUTION AND LITTLE HOCKING WELLFIELD CAPTURE ZONES – TYPICAL PUMPING CONDITIONS (EXPERT REPORT FIG 7)

NOTES
1. LHWA CAPTURE ZONES ADAPTED FROM FIGURE 4-7 OF EXPERT REPORT OF SCOTT BAIR, 2014
2. MAGNITUDE OF OUTFALL DILUTION ADAPTED FROM FIGURES 15-17, LIMNOTECH, 2023

FIGURE 5

RAMBOLL AMERICAS ENGINEERING SOLUTIONS, INC.
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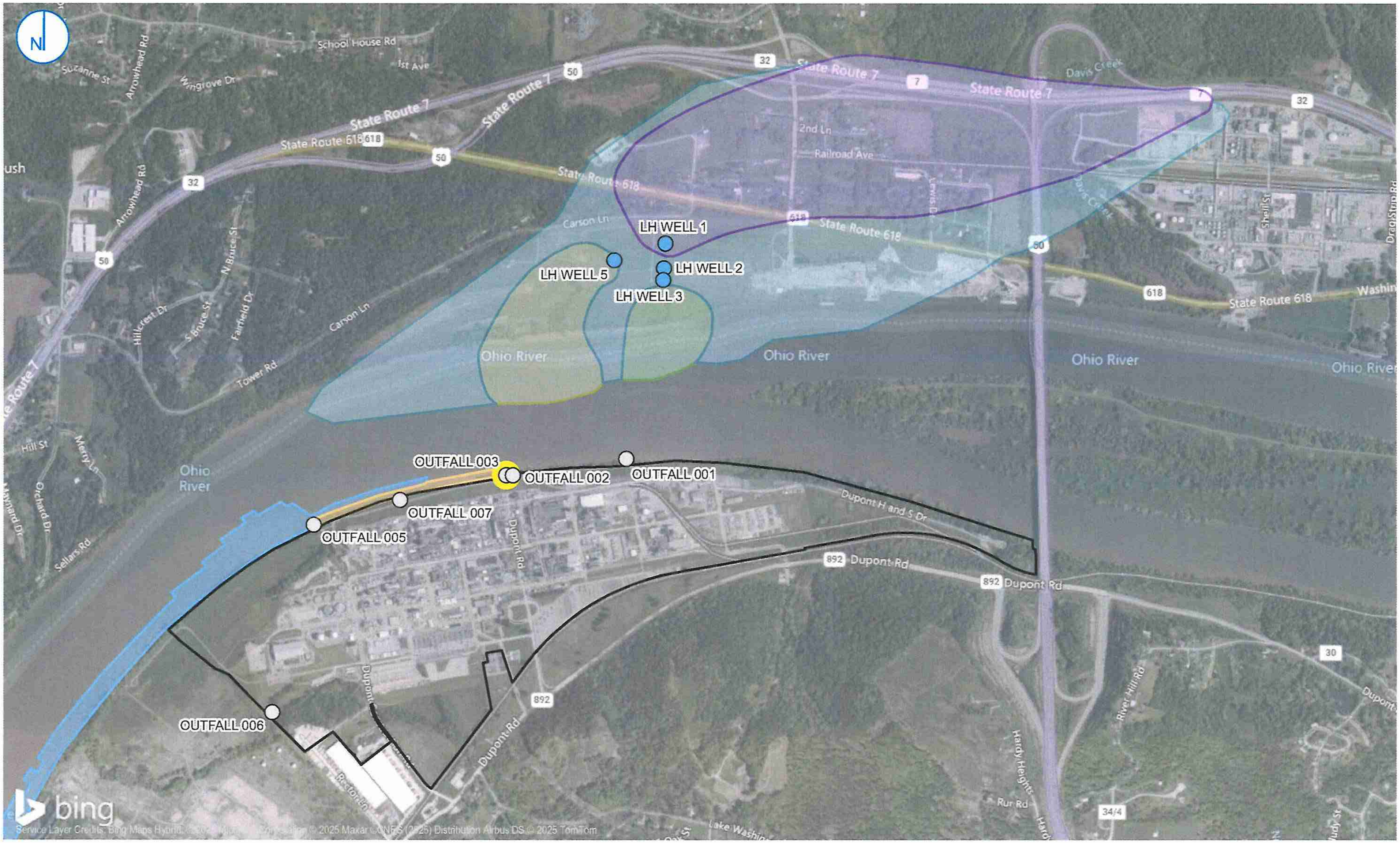

CHEMOURS FACILITY PROCESS OUTFALL
LITTLE HOCKING EXTRACTION WELL
CHEMOURS FACILITY

LHWA CAPTURE ZONES
WELL 1
WELL 2
WELL 3
WELL 5

MAGNITUDE OF OUTFALL DILUTION
100:1
1,000:1

0 800 1,600 Feet

OUTFALL 003 DILUTION AND LITTLE HOCKING WELLFIELD CAPTURE ZONES – TYPICAL PUMPING CONDITIONS (EXPERT REPORT FIG 8)

NOTES
1. LHWA CAPTURE ZONES ADAPTED FROM FIGURE 4-7 OF EXPERT REPORT OF SCOTT BAIR, 2014
2. MAGNITUDE OF OUTFALL DILUTION ADAPTED FROM FIGURES 15-17, LIMNOTECH, 2023

FIGURE 6

RAMBOLL AMERICAS ENGINEERING SOLUTIONS, INC.
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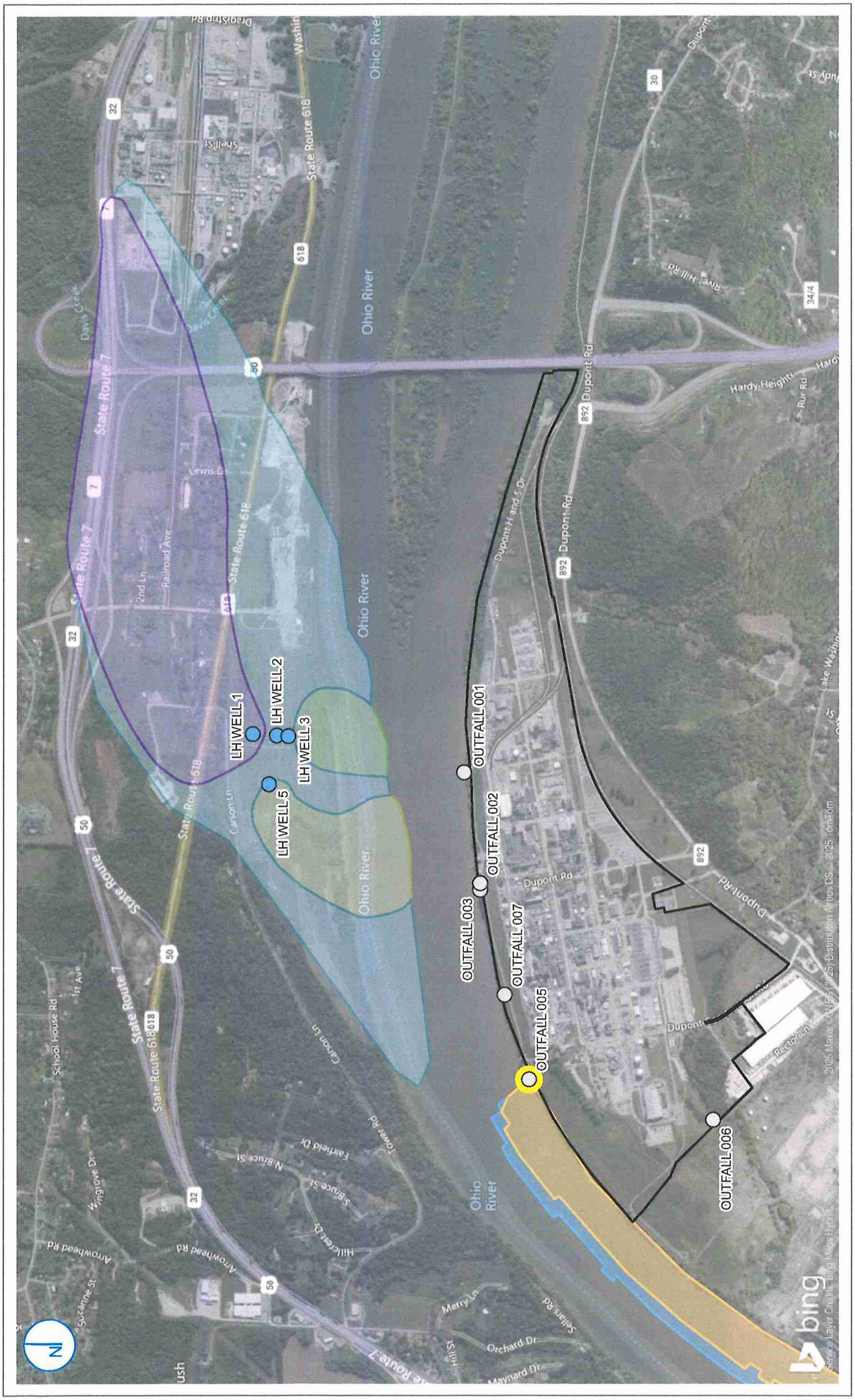

FIGURE 7

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RAMBOLL

OUTFALL 005 DILUTION AND LITTLE HOCKING WELLFIELD CAPTURE ZONES – TYPICAL PUMPING CONDITIONS (EXPERT REPORT FIG 9)

CHEMOURS FACILITY PROCESS OUTFALL

LITTLE HOCKING EXTRACTION WELL

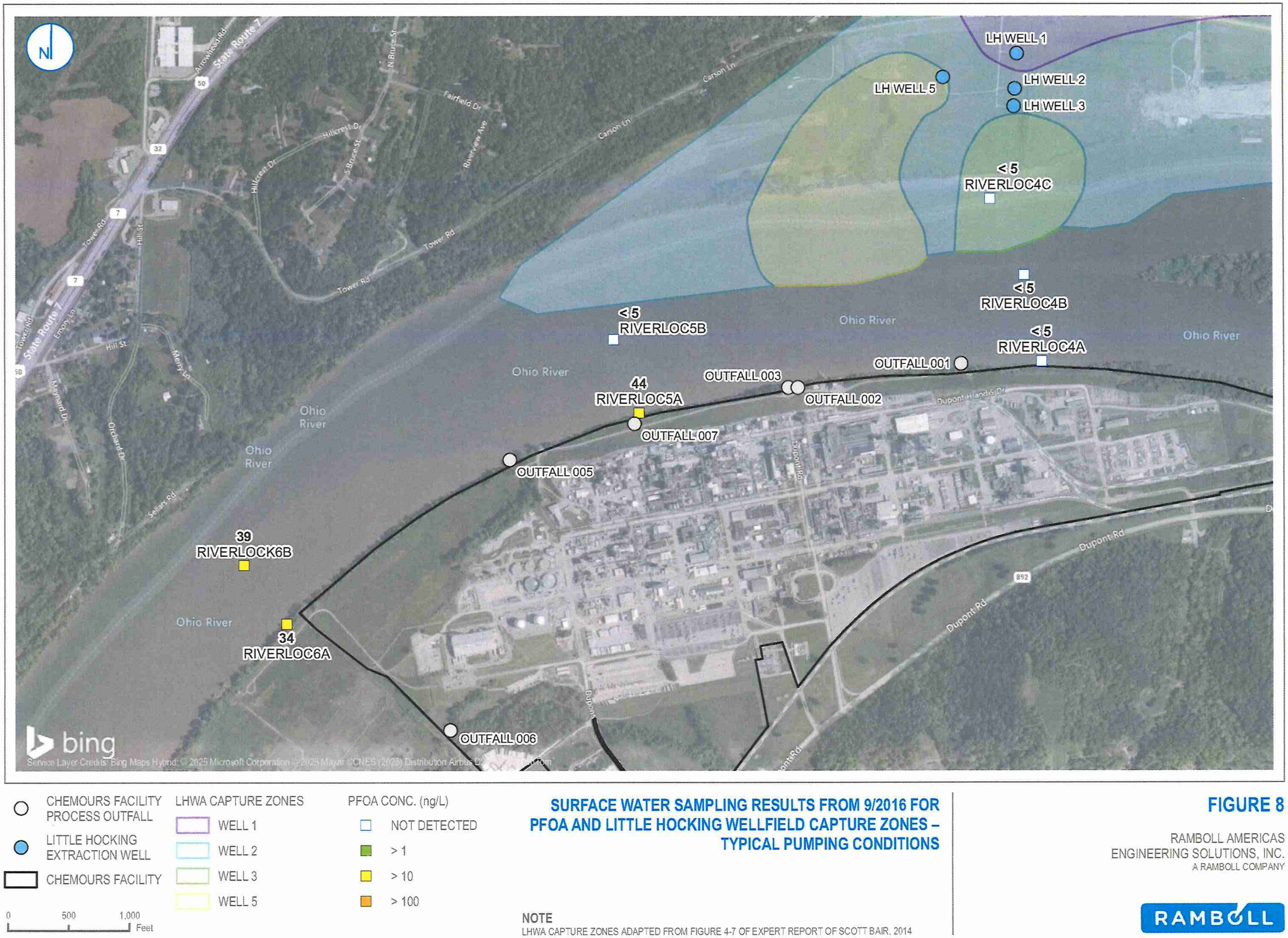
CHEMOURS FACILITY

LHWA CAPTURE ZONES
- WELL 1
- WELL 2
- WELL 3
- WELL 5

MAGNITUDE OF OUTFALL DILUTION
- 100:1
- 1,000:1

0 800 1,600 Feet

NOTES
1. LHWA CAPTURE ZONES ADAPTED FROM FIGURE 4-7 OF EXPERT REPORT OF SCOTT BLAIR, 2014
2. MAGNITUDE OF OUTFALL DILUTION ADAPTED FROM FIGURES 15-17, LIMNOTECH, 2023

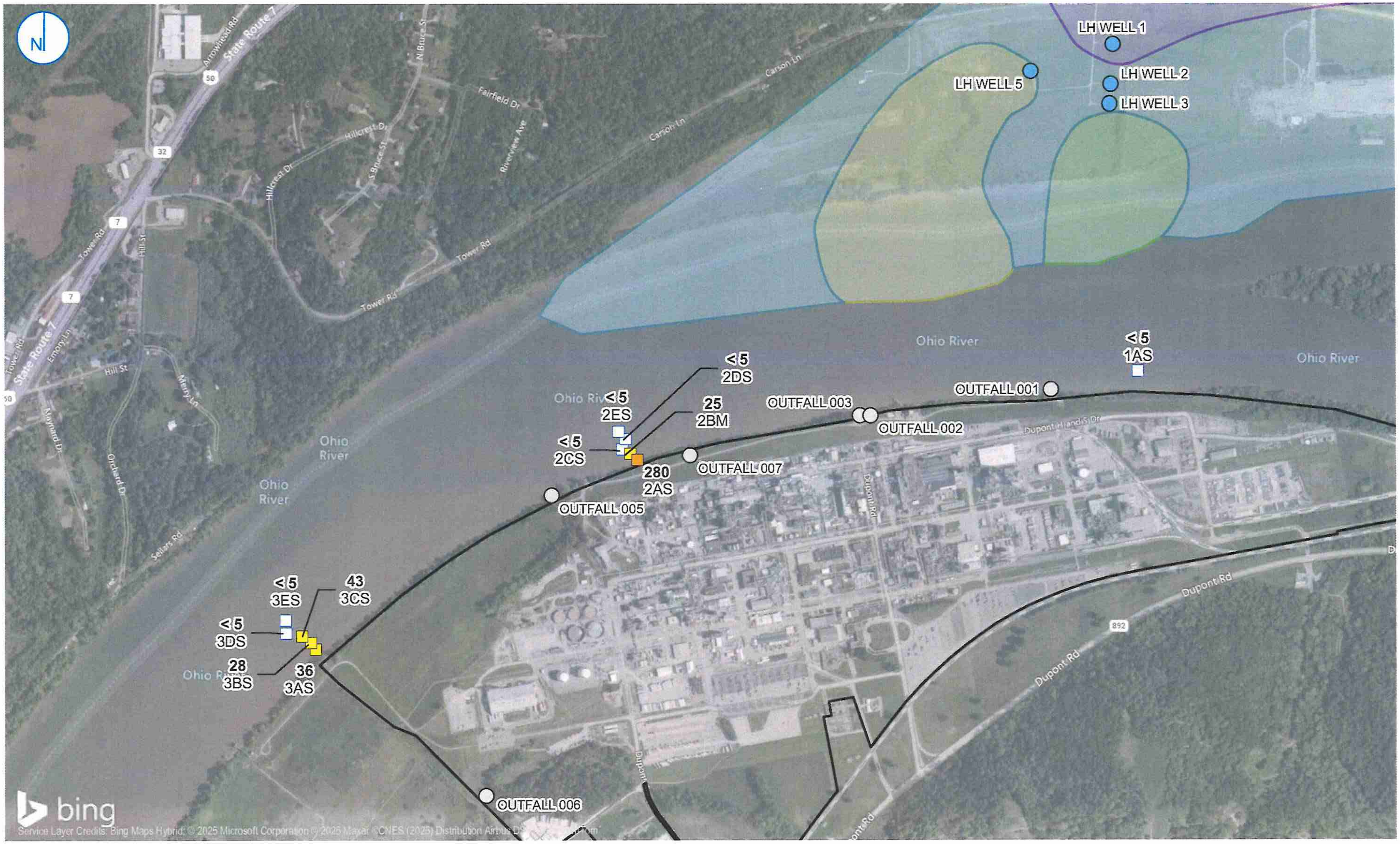


SURFACE WATER SAMPLING RESULTS FROM 9/2016 FOR PFOA AND LITTLE HOCKING WELLFIELD CAPTURE ZONES – TYPICAL PUMPING CONDITIONS

NOTE
LHWA CAPTURE ZONES ADAPTED FROM FIGURE 4-7 OF EXPERT REPORT OF SCOTT BAIR, 2014

FIGURE 8

RAMBOLL AMERICAS ENGINEERING SOLUTIONS, INC.
A RAMBOLL COMPANY



CHEMOURS FACILITY PROCESS OUTFALL

LITTLE HOCKING EXTRACTION WELL

CHEMOURS FACILITY

0 500 1,000 Feet

LHWA CAPTURE ZONES

- WELL 1
- WELL 2
- WELL 3
- WELL 5

PFOA CONC. (ng/L)

- NOT DETECTED
- > 1
- > 10
- > 100

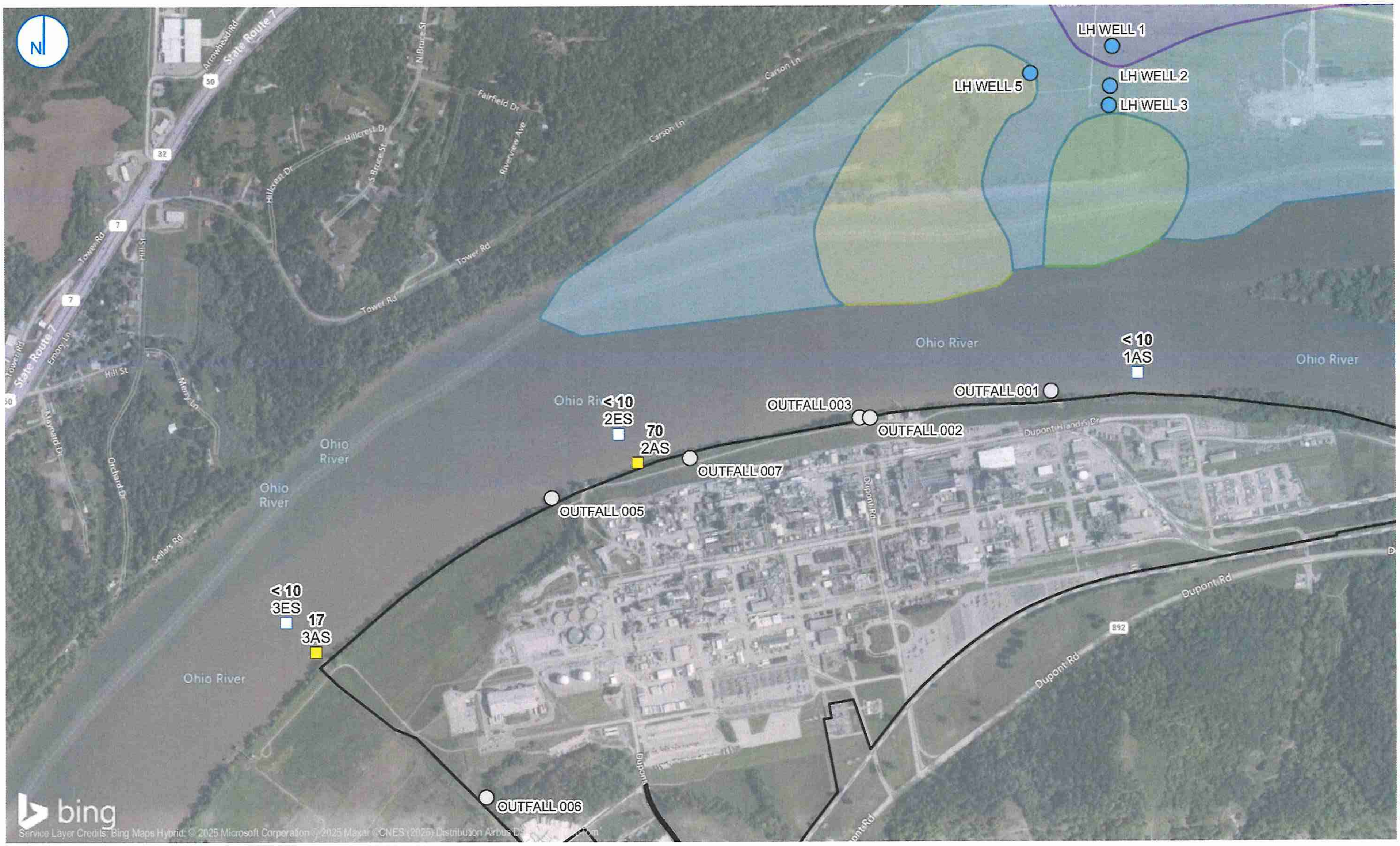
SURFACE WATER SAMPLING RESULTS FROM 11/2017 FOR PFOA AND LITTLE HOCKING WELLFIELD CAPTURE ZONES – TYPICAL PUMPING CONDITIONS

NOTE
LHWA CAPTURE ZONES ADAPTED FROM FIGURE 4-7 OF EXPERT REPORT OF SCOTT BAIR, 2014

FIGURE 9

RAMBOLL AMERICAS ENGINEERING SOLUTIONS, INC.
A RAMBOLL COMPANY

RAMBOLL



CHEMOURS FACILITY PROCESS OUTFALL
LITTLE HOCKING EXTRACTION WELL
CHEMOURS FACILITY

LHWA CAPTURE ZONES
WELL 1
WELL 2
WELL 3
WELL 5

HFPO-DA CONC. (ng/L)
NOT DETECTED
> 1
> 10
> 100

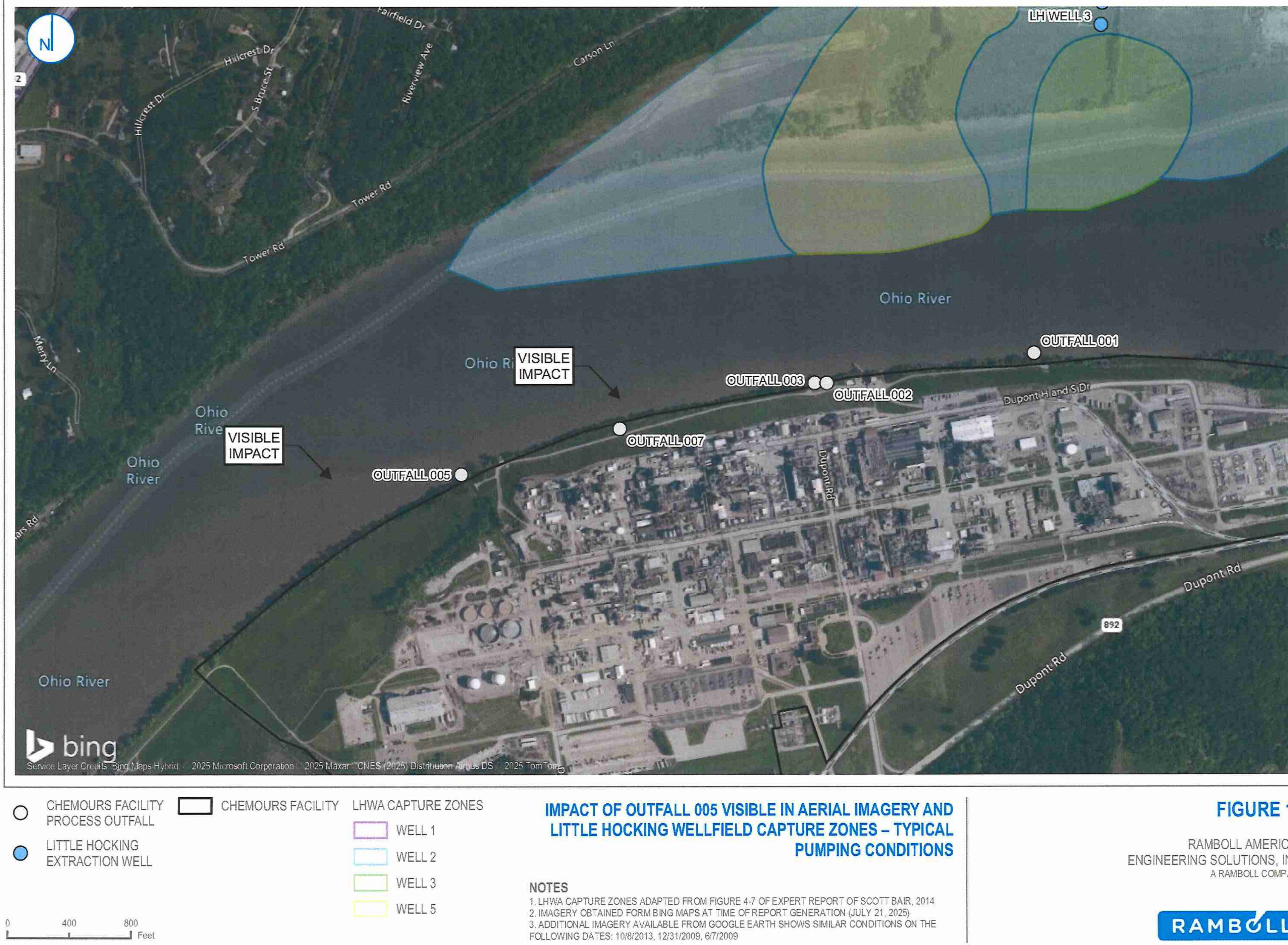
0 500 1,000 Feet

SURFACE WATER SAMPLING RESULTS FROM 11/2017 FOR HFPO-DA AND LITTLE HOCKING WELLFIELD CAPTURE ZONES – TYPICAL PUMPING CONDITIONS

NOTE
LHWA CAPTURE ZONES ADAPTED FROM FIGURE 4-7 OF EXPERT REPORT OF SCOTT BAIR, 2014

FIGURE 10

RAMBOLL AMERICAS ENGINEERING SOLUTIONS, INC.
A RAMBOLL COMPANY



IMPACT OF OUTFALL 005 VISIBLE IN AERIAL IMAGERY AND LITTLE HOCKING WELLFIELD CAPTURE ZONES – TYPICAL PUMPING CONDITIONS

NOTES
1. LHWA CAPTURE ZONES ADAPTED FROM FIGURE 4-7 OF EXPERT REPORT OF SCOTT BAIR, 2014
2. IMAGERY OBTAINED FORM BING MAPS AT TIME OF REPORT GENERATION (JULY 21, 2025)
3. ADDITIONAL IMAGERY AVAILABLE FROM GOOGLE EARTH SHOWS SIMILAR CONDITIONS ON THE FOLLOWING DATES: 10/8/2013, 12/31/2009, 6/7/2009

FIGURE 11

RAMBOLL AMERICAS ENGINEERING SOLUTIONS, INC.
A RAMBOLL COMPANY

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